

Application Number 09/730,199

Responsive to Office Action mailed March 3, 2004

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

Claim 1 (Currently amended): A data storage medium comprising:
a first layer comprising a substrate;
a second layer including a photopolymer, the second layer exhibiting surface variations;
~~wherein the photopolymer is pre-written with the surface variations and cured; and~~
a third layer comprising a thin film stack of a plurality of sub-layers that together form a magnetic recording structure, the thin film stack of the third layer including an underlay to improve growth of microstructures of the sub-layers of the thin film stack during fabrication, a magnetic recording material, and a hard coat, wherein each of the sub-layers of the thin film stack and-substantially conforms-~~ing~~ to the surface variations of the second layer, and wherein the third layer including the thin film stack magnetic recording material forms a substantially continuous layer over the surface variations.

Claim 2 (Canceled).

Claim 3 (Previously presented): The data storage medium as described in claim 1, wherein the first layer is a disk-shaped substrate.

Claim 4 (Previously Presented): The data storage medium as described in claim 1, wherein the first layer provides rigidity and mechanical stability to the medium.

Claim 5 (Currently amended): The data storage medium as described in claim 1, wherein the first layer comprises one of the following: glass, aluminum, aluminum-magnesium alloy, ceramic ~~and-or~~ plastic.

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Claim 6 (Previously presented): The data storage medium as described in claim 1, wherein the photopolymer includes a photopolymerized material.

Claim 7 (Previously Presented): The data storage media as described in claim 6, wherein the photopolymer comprises at least 30% by weight of radiation polymerized components selected from epoxy-terminated silanes.

Claim 8 (Currently amended): The data storage medium as described in claim 1, wherein the surface variations are machine-readable data patterns that define at least one bit pitch of approximately 200 nanometers.

Claim 9 (Original): The data storage medium as described in claim 8, wherein the data patterns include data bumps.

Claim 10 (Original): The data storage medium as described in claim 9, wherein at least some of the data bumps comprise encoded data.

Claim 11 (Original): The data storage medium as described in claim 1, wherein the surface variations are protrusions.

Claim 12 (Original): The data storage medium as described in claim 11, wherein the surface variations include at least one of the following: bumps, rails, lands and ridges

Claim 13 (Original): The data storage medium as described in claim 1, wherein the surface variations are depressions.

Claim 14 (Original): The data storage medium as described in claim 13, wherein the surface variations include at least one of the following: pits, grooves, and channels.

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Claim 15 (Original): The data storage medium as described in claim 1, wherein the surface variations contain servo patterns.

Claim 16 (Currently amended): The data storage medium as described in claim 1, wherein the surface variations project from the medium a height less than 20 nanometers ~~wherein the surface variations contain tracking patterns.~~

Claim 17 (Previously Presented): The data storage medium as described in claim 1, wherein the surface variations project from the medium a height less than 50 nanometers.

Claims 18-20 (Canceled).

Claim 21 (Currently amended): The data storage medium as described in claim 1 ~~20~~, wherein the underlay includes a chrome alloy and the magnetic recording material includes a cobalt alloy.

Claim 22 (Original): The data storage medium as described in claim 21, wherein the hard coat includes at least one of the following: carbon, nitrogenated-carbon, and hydrogenated-carbon.

Claim 23 (Previously Presented): The data storage medium as described in claim 1, wherein the third layer further includes a buffer.

Claim 24 (Previously Presented): The data storage medium as described in claim 1, further comprising a fourth layer substantially conforming to the surface variations.

Claim 25 (Original): The data storage medium as in claim 24, wherein the fourth layer includes a lubricating material.

Claim 26 (Previously presented): The data storage medium as in claim 25, wherein a medium surface is flyable.

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Claim 27 (Currently amended): A data storage medium comprising:

- a substantially rigid substrate;
- a photopolymer containing surface variations, ~~wherein the photopolymer is pre-written with the surface variations and cured;~~
- a thin film stack substantially conforming to the surface variations, and comprising a plurality of sub-layers that together form a magnetic recording structure, the thin film stack including an underlayer to improve growth of microstructures of the sub-layers of the thin film stack during fabrication, a magnetic recording material and a hard coat; and
- a lubrication layer substantially conforming to the surface variations,
- wherein the surface variations are arranged to define a topology which creates detectable changes in ambient conditions as a transducer flies over the data storage medium in a machine-readable pattern.

Claim 28 (Currently amended): A data storage medium comprising:

- a flexible contact media substrate;
- a photopolymer containing surface variations, ~~wherein the photopolymer is pre-written with the surface variations and cured;~~
- a thin film stack substantially conforming to the surface variations and comprising a plurality of sub-layers that together form a magnetic recording structure, the thin film stack including an underlayer to improve growth of microstructures of the sub-layers of the thin film stack during fabrication, a magnetic recording material and a hard coat; and
- a lubrication layer substantially conforming to the surface variations,
- wherein the surface variations are arranged to define a topology which creates detectable changes in ambient conditions as a transducer flies over the data storage medium in a machine-readable pattern.

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Claim 29 (Currently amended): A data storage medium comprising:

a substantially transparent plastic substrate including optically detectable features formed in the substrate;

a reflective layer to facilitate optical detection of the optically detectable features via reflection of an optical signal;

a photopolymer layer formed over the reflective layer, the photopolymer layer being formed with ~~containing~~ surface variations, ~~wherein the photopolymer is pre-written with the surface variations and cured~~;

a thin film stack comprising a plurality of sub-layers that together form a magnetic recording structure, the thin film stack, including an underlayer to improve growth of microstructures of the sub-layers of the thin film stack during fabrication, a magnetic recording material and a hard coat, and wherein the thin film stack substantially conforms ing ~~ing~~ to the surface variations; and

a lubrication layer substantially conforming to the surface variations,

wherein the surface variations are arranged to define a topology which creates detectable changes in ambient conditions as a transducer flies over the data storage medium in a machine-readable pattern.

Claim 30 (Currently amended): A data storage medium comprising:

a first data storage layer;

a second data storage layer, the second data storage layer including a photopolymer containing surface variations, wherein the photopolymer is pre-written with the surface variations and cured;

a thin film stack comprising a plurality of sub-layers that together form a magnetic recording structure, the thin film stack, including an underlayer to improve growth of microstructures of the sub-layers of the thin film stack during fabrication, a magnetic recording material and a hard coat, and wherein the thin film stack substantially conforms ing ~~ing~~ to the surface variations; and

a lubrication layer substantially conforming to the surface variations,

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wherein the surface variations are arranged to define a topology which creates detectable changes in ambient conditions as a transducer flies over the data storage medium in a machine-readable pattern.

Claim 31 (Currently amended): A removable hard disk unit comprising:

a housing; and

a data storage medium unit within the housing comprising:

a first layer comprising a substrate;

a second layer including a photopolymer, the second layer exhibiting surface variations arranged to define a topology which creates detectable changes in ambient conditions as a transducer flies over the data storage medium, wherein the photopolymer is pre-written with the surface variations and cured; and

a third layer comprising a thin film stack of a plurality of sub-layers that together form a magnetic recording structure, the thin film stack of the third layer including an underlay to improve growth of microstructures of the sub-layers of the thin film stack during fabrication, a magnetic recording material, and a hard coat, wherein each sub-layer of the thin film stack and substantially conforms ing to the surface variations of the second layer, and wherein the third layer including the thin film stack magnetic recording material forms a substantially continuous layer over the surface variations; and

a flying head transducer within the housing that produces a signal representative of the changes in ambient conditions.

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Claim 32 (Currently amended): A system comprising:

a housing;

a flying head transducer within the housing; and

a data storage unit medium within the housing comprising:

a first a layer comprising substrate;

a second layer including a photopolymer, the second layer exhibiting surface variations arranged to define a topology which creates detectable changes in ambient conditions as the flying head transducer flies over the data storage medium, wherein the photopolymer is pre-written with the surface variations and cured; and

a third layer comprising a thin film stack of a plurality of sub-layers that together form a magnetic recording structure, the thin film stack of the third layer including an underlay to improve growth of microstructures of the sub-layers of the thin film stack during fabrication, a magnetic recording material, and a hard coat, wherein each sub-layer of the thin film stack and-substantially conforms ing to the surface variations of the second layer, and wherein the third layer including the thin film stack magnetic-recording material-forms a substantially continuous layer over the surface variations,

wherein the flying head transducer produces a signal representative of the changes in ambient conditions.

Claim 33-43 (Canceled).